

TWO NEW SPECIES OF GENUS *COLLOTHECA* HARRING 1913
(ROTIFERA: MONOGONONTA) FROM FRESHWATERS OF TRIPURA, INDIA¹

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(With two text-figures)

Key words: *C. tetralobata* sp. nov., *C. hexalobata* sp. nov., new species,
freshwater wetland

The present study recorded two new species: *Collotheca tetralobata* sp. nov. and *C. hexalobata* sp. nov. from the wetlands of Tripura which are described here. In order to find out their ecological niche characteristics, different physicochemical factors of water, preference of plant-substrata, and seasonal occurrence of the species were also noted.

INTRODUCTION

Collotheca belongs to the sessile fauna under Phylum Rotifera. In India, some workers (Anderson 1889, Sarma and Rao 1986, Sarma 1988, Banik and Kar 1995) studied the taxonomy of the genus. However, Koste (1978) made a detailed study on their taxonomy with regard to the European region. In taxonomic observations, knowledge of ecological conditions is most helpful to get an idea of the distribution of species, which is lacking in most descriptions of new taxa (Anderson 1889, Segers *et al.* 1994).

The present work describes two new rotifer species with their ecological characteristics such as physicochemical conditions of their freshwater habitat, nature of plant substrata and seasonal occurrence.

MATERIAL AND METHODS

The rotifer fauna were collected live from natural substrata (such as root, stem and leaf of hydrophytes) from the littoral region of shallow water wetlands of Agartala, Tripura (23° 50' 15" N and 91° 15' 45" E) during 1994-1997. The live specimens were examined under an Olympus

Trinocular-KH microscope with a camera lucida. Preparation of trophi was done following the method of Banik and Kar (1995) and Banik (1996). The physicochemical analysis of freshwater was made following APHA (1992).

Type specimens were deposited in the Fishery Laboratory, University of Calcutta, Kolkata (MFLC) and in the collection of the Fishery & Limnology Research Unit, Tripura University, Tripura (RTU). All measurements (size of body, amictic and resting eggs of the rotifer fauna) are expressed in μm . Koste's (1978) key was followed for the description of the taxa.

RESULTS

Family: Collotheceidae

Genus: *Collotheca* Haring 1913

Collotheca tetralobata sp. nov.

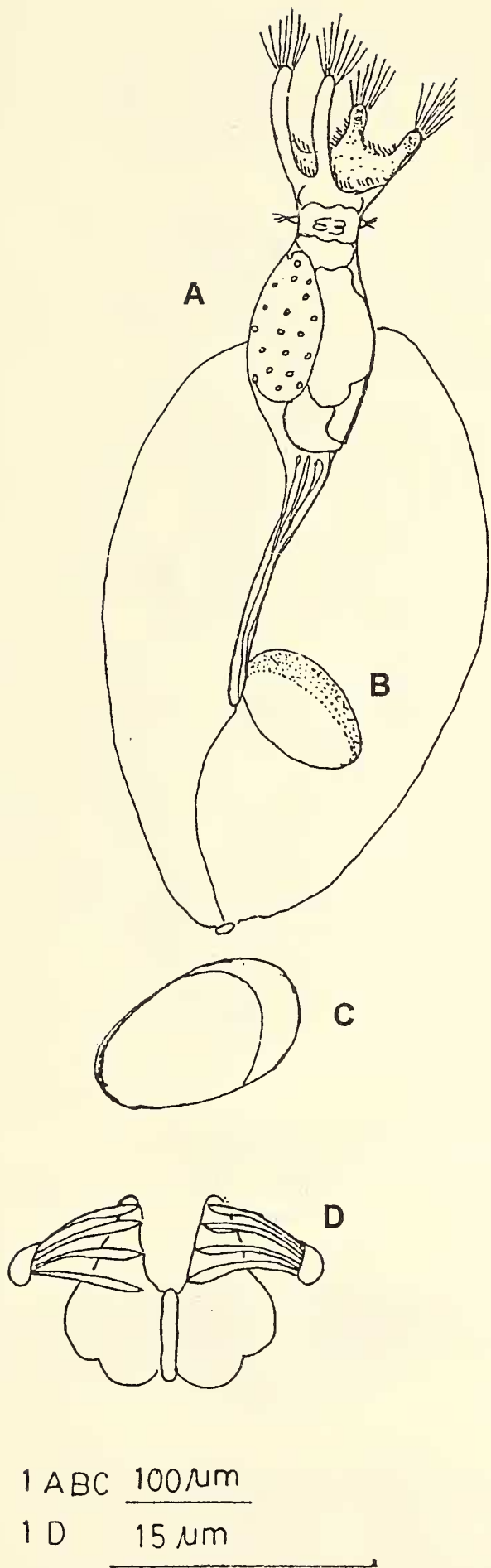
Collotheca hexalobata sp. nov.

Collotheca tetralobata sp. nov.

Materials examined: Twelve parthenogenetic females (Holotype, MFLC 219); nine parthenogenetic females (Paratype, MFLC 220); a glass vial with 23 specimens (Paratype, MFLC 221). One parthenogenetic female, one mictic female (Paratype, RTU); six parthenogenetic females (Paratype, RTU); permanent mounted slide consists of entire animal and trophi (RTU).

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1 ABC 100 μm
 1 D 15 μm

Fig. 1: *Collotheca tetralobata* sp. nov.,
 A. The specimen in normal condition,
 B. Amictic egg, C. Resting egg, D. Trophi

Description: Parthenogenetic Females (Figs 1A-D). Corona with four unequal, blunt lobes (two longer) and tetragonally arranged. Bristles longer at the tip of the lobes. Cilia very small at interlobal area. Germovitellarium distinct during pre-reproductive period. Lorica transparent, very long, oval-shaped. Holdfast much longer. Longitudinal and circular muscles of coronal lobes distinct during relaxation. Antennae paired, laterally placed between coronal funnel and the trunk. Amictic eggs, 3-5 at a time. Resting eggs, 1-2 at a time. Just before laying eggs, the animal undergoes a resting condition for a few seconds. Trophi uncinus type (Fig. 1D), uncinus and subuncus distinct. Males unknown.

Measurements in μm:

| | |
|--------------------------|---------|
| Total length of the body | 700-770 |
| Length of the lorica | 400-467 |
| Length of longer tube | 97-106 |
| Length of shorter tube | 63-69 |
| Breadth of corona | 57-65 |
| Length of the trunk | 216-221 |
| Breadth of trunk at apex | 43-49 |
| Breadth of trunk at base | 15-19 |
| Length of the foot | 220-248 |
| Length of the holdfast | 167-195 |
| Length of amictic egg | 100-116 |
| Width of amictic egg | 71- 89 |
| Length of resting egg | 173-184 |
| Width of resting egg | 102-112 |

Differential diagnosis: The new species belongs to the *C. ornata* type, but is easily distinguished from *C. ornata* by the presence of two longer lobes and two shorter lobes, paired lateral antennae, very long holdfast and interlobal cilia, and by the absence of pentagonal arrangement of five short lobes and very reduced holdfast.

Collotheca tetralobata sp. nov. might also be confused with the congener possessing blunt lobes. *C. ornata*, however, has odd numbered smaller lobes of similar size and varied shape of lorica.

Ecological Characteristicsa) *Physicochemical conditions of water:*

The new species was found in temperatures of 10-21 °C, dissolved oxygen 4.7-8.9 ppm, pH 6-6.9, bicarbonate 63-98 ppm, silicate 3-9 ppm and dissolved organic matter 3-7.6 ppm.

b) *Plant-substrata preference:* This species occurs on stems and leaves of *Utricularia vulgaris*. Sometimes occurred on root-hairs of *Eichhornia crassipes* also. However, it was not seen in any other macrophytes.

c) *Seasonal Occurrence:* *Collotheca tetralobata* sp. nov. was noted in the winter months only.

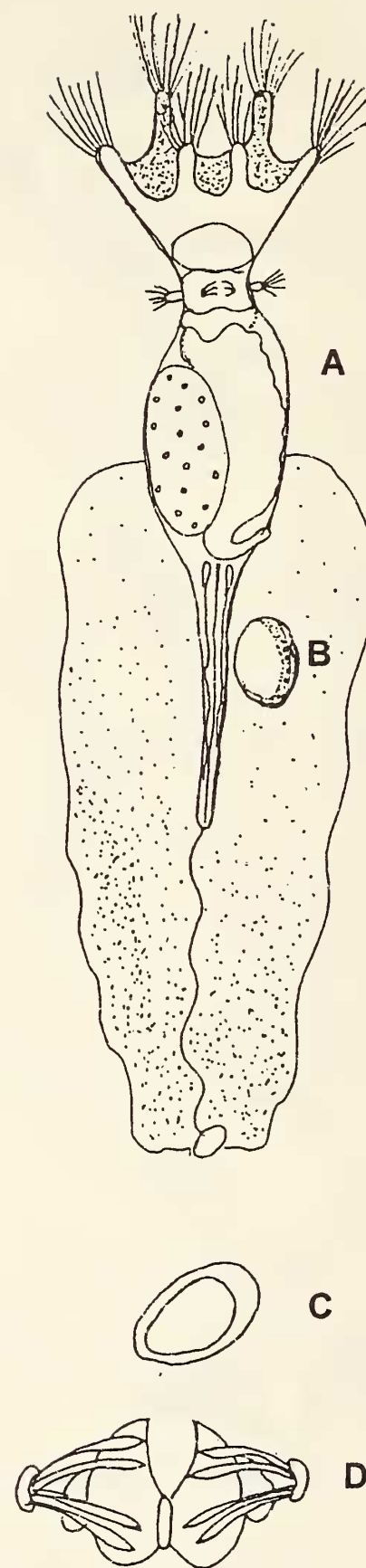
***Collotheca hexalobata* sp. nov.**

Material examined: Nine parthenogenetic females (Holotype, MFLC 323); eleven parthenogenetic females (Paratype, MFLC 324), vial with 30 specimens (Paratype, MFLC 325). One parthenogenetic female, one mictic female (Paratype, RTU), five parthenogenetic females (Paratype, RTU), permanent mounted slide with entire animal and trophi (RTU).

Description: Parthenogenetic females (Figs 2A-D). Corona broad with six equal, blunt lobes arranged hexagonally. Bristles longer, germovitellarium distinct during adult period. Lorica less transparent, wavy at the lower part. Holdfast much longer, with continuous contraction habit. Base of holdfast broad, oval. Antennae paired, lateral. Amictic eggs, 2-3 at a time. Resting eggs, 2-3 time. Trophi unciniate type (Fig 2D). Males unknown, probably distorted during mounting process.

Measurements in μm :

| | |
|--------------------------|-------------|
| Total length of the body | 1,426-1,530 |
| Length of the lorica | 300-398 |
| Length of the lobe | 65-79 |
| Breadth of the corona | 271-280 |
| Length of the trunk | 383- 400 |
| Breadth of trunk at apex | 97-101 |
| Breadth of trunk at base | 59-65 |



2 ABC $\underline{100 \mu\text{m}}$
2D $\underline{15 \mu\text{m}}$

Fig. 2: *Collotheca hexalobata* sp. nov.,
A. The specimen in normal condition,
B. Amictic egg, C. Resting egg, D. Trophi

| | |
|------------------------|---------|
| Length of the foot | 357-381 |
| Length of the holdfast | 477-510 |
| Length of amictic egg | 107-118 |
| Width of amictic egg | 73-88 |
| Length of resting egg | 168-180 |
| Width of resting egg | 100-113 |

Differential diagnosis: The new species belongs to the *C. tenuilobata* type, but is easily distinguished from *C. tenuilobata* by the presence of six lobes, longer holdfast and its broad and oval base and by the absence of pentagonal arrangement of tubular lobes, interlobal cilia, greatly reduced holdfast with small and round base and a transparent lorica.

C. hexalobata sp. nov. might also be confused with the congener whose tubular lobes look like blunt lobes and the longer holdfast seems to be a reduced one under contracted condition of the whole body, which is an important behavioural character of *C. tenuilobata*. However, *C. tenuilobata* under relaxed condition shows a transparent lorica, pentagonal lobes and much reduced holdfast.

Ecological Characteristics: a) *Physico-chemical conditions of water:* *C. hexalobata* sp. nov. was found at temperatures of 16-34 °C, dissolved oxygen 3.6-7.8 ppm, pH 5.7-6.8, bicarbonate 34-89 ppm and dissolved organic matter 6-13 ppm.

b) *Plant-substrata preference:* This species was found only on root-hairs of *Eichhornia crassipes*.

c) *Seasonal Occurrence:* It was observed mostly during summer, and only one individual was noted in winter (i.e. in December 1994 and November 1996).

DISCUSSION

The morphological characteristics of the two new species *C. tetralobata* sp. nov. and *C. hexalobata* sp. nov. do not exhibit any specific similarity with known rotifer species of *Collotheca* Haring 1913 (Koste 1978). *C. tetralobata* sp. nov. can be confused with *C. ornate* and *C. hexalobata* sp. nov. with *C. temalobata* to some extent. However, the new taxa are quite different from the known rotifer species because of some distinct, new and easily identifiable taxonomic characters (Segers *et al.* 1992, 1994).

Besides this, the most interesting feature of the new taxa is species-specific ecological niche characteristics such as physicochemical condition of water, preference of particular plant-substratum for growth, food and occurrence of species in particular season(s) (Banik 1987, Datta and Banik 1987, Banik and Kar 1995, Banik 1996, 1997, 1998, 1999).

The present observation confirms that shallow freshwater bodies of Tripura are much neglected in studies of sessile rotifers (Banik *et al.* 1994)

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